

HW3

Problem 1

Let $\hat{\theta} = \bar{x}$ be an estimate of μ . Show that the jackknife estimate of the bias is 0.

Problem 2

Continuing from HW 2. Let $X \sim \text{Poisson}(\theta)$. Let the parameter of interest be $g(\theta) = \exp(-\theta)$.

- a) Use the jackknife method to estimate the bias \hat{b} of $\exp(-\bar{x})$.
- b) Compare the bias-corrected MLE to the UMVUE from last homework for several values of n . Comment on the improvement.
- c) Use the bootstrap to estimate the bias of $\exp(-\bar{x})$. You should compare non-parametric bootstrap where you sample from x^n with replacement and parametric bootstrap where you sample from $\text{Poisson}(\hat{\theta})$. Do this for different n as in HW2.
- d) Compare the bootstrap estimate of the bias of $\exp(-\bar{x})$ to the jackknife estimate in a).